

AMENDMENTS TO THE CLAIMS

1.-11. (Canceled)

12. (Currently Amended) A programmable display apparatus that monitors and displays a state of a control target equipment, comprising:

storage means for storing ~~a control program having a plurality of instructions and symbol data for displaying a plurality of symbols related to each of~~ a plurality of said plurality of instructions executed by said control target equipment;

~~control means for controlling control target equipment electrically connected to said programmable display apparatus by executing each of said plurality of instructions;~~

display means for displaying an image;

first display control means, ~~means~~ based on the symbol data corresponding to the instructions executed by said control target equipment, ~~control means~~ for causing the symbols corresponding to said executed instructions to be displayed in a first display region in said display means;

video signal input means for receiving an input of video data generated based on a picked-up image of said control target equipment for each of the instructions;

video data storing means for storing said video data;

relation means for relating the symbol data corresponding to the instructions executed by said control target equipment ~~said control means~~ to the video data stored in said video data storing means;

determining means for determining abnormality of the control target equipment;

detection means for detecting, upon determination of the abnormality by the determining means, designation of a symbol associated with a signal indicating the determined abnormality of the control target equipment among the plurality of symbols displayed in said first display region; and

second display control means responsive to detection of said designation for causing a moving image to be displayed in a second display region in said display means based on the video data related to the symbol data corresponding to the symbol displayed in said first display region,

wherein the second display control means displays the moving image of at least one of a time period from a predetermined time previous to said detection and a time period to a predetermined time after said detection, and

wherein said programmable display apparatus monitors and displays the state of said control target apparatus without providing any program from the programmable display apparatus to said control target apparatus.

13. (Previously Presented) The programmable display apparatus according to claim 12, further comprising:

timer means for measuring a time, wherein

said relation means relates the symbol data corresponding to the symbols displayed in said first display region to the video data input through said video signal input means based on the time measured by said timer means.

14. (Currently Amended) The programmable display apparatus according to claim 13, further comprising:

state signal input means for receiving an input of a state signal indicating the state ~~indicating a state~~ of said control target equipment;

log generation means for generating log information representing history of an operation of said control target equipment based on said time and said state signal; and

log storing means for storing said log information, wherein

said relation means relates the symbol data corresponding to the symbols displayed in said first display region to said log information.

15. (Previously Presented) The programmable display apparatus according to claim 14, wherein

said state signal input means receives an input of said signal indicating an abnormality in said control target equipment,

said log generation means generates log information indicating an abnormality in said control target equipment when said signal indicating an abnormality is input,

said relation means relates a time at which said log information indicating an abnormality is generated to said log information indicating an abnormality for storage in said log storing means, and

said first display control means causes the symbols to be displayed in said first display region by making a difference between an output form of the symbol data for displaying the symbols corresponding to said log information indicating an abnormality and an output form of the symbol data for displaying the symbols corresponding to a normal state in said control target

equipment, so that a first display manner in said display means of the symbols corresponding to said log information indicating an abnormality differs from a second display manner in said display means of the symbols corresponding to said normal state.

16. (Previously Presented) The programmable display apparatus according to claim 15, wherein

said detection means detects designation of the symbols displayed in said first display manner,

said programmable display apparatus further comprising:

reading means for reading time corresponding to said log information indicating an abnormality from said log storing means based on detection of said designation; and

reproduction means for reading video data corresponding to a predetermined period of time from said read time, wherein

said second display control means causes a moving image to be displayed in said second display region based on the video data read by said reproduction means.

17. (Previously Presented) The programmable display apparatus according to claims 16, wherein said display means displays said first display region and said second display region in the same screen.

18. (Previously Presented) The programmable display apparatus according to claim 15, wherein

said detection means detects designation of the symbols displayed in said first display manner,

said programmable display apparatus further comprising:

reading means for reading time corresponding to said log information indicating an abnormality from said log storing means based on detection of said designation; and

reproduction means for reading video data corresponding to a period of time from predetermined time previous to said time to predetermined time subsequent to said time, wherein

said second display control means causes a moving image to be displayed in said second display region based on the video data read by said reproduction means.

19. (Previously Presented) The programmable display apparatus according to claim 18, wherein said display means displays said first display region and said second display region in the same screen.

20. (Previously Presented) The programmable display apparatus according to claim 15, wherein

said second display control means includes

time data reading means for reading each time corresponding to each of said plurality of symbols from said log storing means,

video data reading means for reading video data corresponding to a predetermined period of time from said read each time for each of said plurality of symbols from said log storing means, and

reproduction control means for causing a moving image to be displayed in said second display region in time order or backward in time from said time corresponding to any symbol of which said designation is detected based on said read video data.

21. (Previously Presented) The programmable display apparatus according to claim 20, wherein said display means displays said first display region and said second display region in the same screen.

22. (Previously Presented) The programmable display apparatus according to claim 12, wherein

said video signal input means receives an input of each video data generated based on an image of said control target equipment picked up by each of a plurality of image picking-up means,

said relation means relates each symbol data corresponding to each of a plurality of instructions executed by said control means to said each video data, and

said second display control means causes each moving image to be displayed in said second display region based on said each video data.

23. (Currently Amended) A non-transitory computer-readable recording medium storing thereon a program causing a computer to function as a programmable display apparatus that monitors and displays a state of a control target equipment, said program causing said computer to execute the steps of:

reading ~~a control program having a plurality of instructions and each~~ symbol data for displaying a plurality of symbols related to each of a plurality of said plurality of instructions executed by said control target equipment from storage means for storing data;

~~controlling control target equipment electrically connected to said computer by executing each of said plurality of instructions;~~

based on the symbol data corresponding to the instructions executed by said control target equipment ~~at said controlling step~~, causing the symbols corresponding to said executed instructions to be displayed in a first display region in display means for displaying an image;

receiving an input of video data generated based on a picked-up image of said control target equipment for each of the instructions;

relating the symbol data corresponding to said executed instructions to said video data;

storing said video data in said storage means;

determining abnormality of the control target equipment;

detecting, upon determining abnormality, designation of a symbol associated with a signal indicating the determined abnormality of the control target equipment among the plurality of symbols displayed in said first display means; and

in response to detection of said designation, causing moving images relating to the designated symbols to be displayed in a second display region in said display means based on the video data related to the symbol data corresponding to the designated symbols displayed in said first display region,

wherein the second display region displays the moving image during a period of at least one of prior to and after said detection, and

wherein said programmable display apparatus monitors and displays the state of said control target apparatus without providing any program from the programmable display apparatus to said control target apparatus.

24. (Canceled)

25. (Previously Presented) The programmable display apparatus according to claim 12, wherein the second display means is configured to start reproduction from an image associated with a symbol of the plurality of symbols, said symbol being associated with an abnormality.

26. (Previously Presented) The programmable display apparatus according to claim 25, wherein the second display means displays an image at every predetermined period of time or a snap shot for each of the plurality of symbols.

27. (Previously Presented) The programmable display apparatus according to claim 26, wherein the control program is a ladder program, and the ladder program includes the plurality of symbols.

28. (Currently Amended) The non-transitory computer-readable recording medium according to claim 23, wherein said program causes the computer to execute the step of starting reproduction from an image associated with a symbol of the plurality of symbols, said symbol being associated with an abnormality.

29. (Currently Amended) The non-transitory computer-readable recording medium according to claim 28, wherein said step of starting reproduction includes the step of displaying an image at every predetermined period of time or a snap shot for each of the plurality of symbols.

30. (Currently Amended) The non-transitory computer-readable recording medium according to claim 29, wherein the control program is a ladder program, and the ladder program includes the plurality of symbols.